

Budgeting and Planning

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Goals

To understand that:

- A **budget** is not “just” a request for funding
- A good **plan** needs a good budget
- A **good** budget shows that you have a **good** plan

The goals are NOT

- To present the budget for your implementation
- To provide the plan for your implementation

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Viability study

- What physical infrastructure is available?
- What technical infrastructure is already in use?
- Where is the closest point of presence for power/energy?
- Where is the closest point of presence for Internet?
- Weather conditions and terrain
- Accessibility for transport
- Legislation (radio/tower)

Existing Physical Infrastructure



- Many existing sites?
 - Measurements (SNR)
- Measure distance to other point(s)
 - GSM, map, car
- Equipment to bring
 - Binoculars (line-of-sight), digital camera
 - Torch or blinking lamp
 - Adequate clothes, rope, climbing gear, helmet

Existing Technical Infrastructure

- Existing wireless infrastructure
- Existing antennas and cabling
- Other equipment on site
- Frequencies/channels
- Radio power

Access to Power/Energy

- Distance to closest power grid
 - Dig and hook on
 - Permission
- Wind or solar cells
 - Installation and transport
 - Yearly maintenance cost

Internet Connectivity

- Wired versus Wireless
 - Price vs performance
- Optical fiber or twisted pair
 - Protection (PVC)
 - Water tightness

Hardware Budgeting

- Case study included
 - Radio and networking hardware
- Other relevant issues for budgeting

Hardware Budgeting

- Stable source of electricity (UPS)
- Electrical grounding and lightening protection
 - Direct and indirect hits
- Practical tools
 - Climbing gear, walkie-talkie, ladders, backpackers, GPS equipment, maps, trip-meter, binoculars, blinking lamp or torch, ropes, tape and a standard tool box
- Local Transport

Licenses and Permissions

- Permission to build tower (see “Communication Tower”)
 - Owner of house/tower/plot
 - Authority handling regulations of airspace
- Permission to operate IEEE 802.11
 - Unlicensed (license free within limits)
 - License is required

Licenses and Permissions

- “Unlicensed” implies that no license is needed
- “Unlicensed” does not imply unregulated
 - The maximum power output is regulated
- Regulations varies from country to country.
- Typically “Commission for Communication” handles the licenses

Licenses and Permissions

Fees to operate “IP Protocol Services” in Tanzania

<i>Fee</i>	<i>Commercial use</i>	<i>Closed Group *</i>
Application fee	65 USD	50 USD
Initial fee	1 000 USD	300 USD
Annual fee	5 000 USD	200 USD

* Closed groups are defined as Governmental departments, Health care and Community Centers

Source: Tanzanian Communication Commission [<http://www.tcc.or.tz>], 2005

Procurement of Equipment

- Local purchase
 - Heavy and bulky items
- Import
 - Transport and Insurance
 - Pre-shipment inspection
 - Import duty
 - Clearance of goods (clearance agent)
 - Delivery time

Implementation Phase

- Before you start:
 - Equipment procured and delivered
 - Licenses and permissions obtained and paid
- Time for implementation (weather conditions)
- Project team (experience)

General about Contracts

- Delivery time
- Transport
- Testing
- Warranty
- Currency

Public Tenders

- Prepare a good specification in advance
- Specify what you want and you **do not** want
- Let someone with experience review your specification.
Bring outsiders in the process
- Do not forget: testing and evaluation
- **Expect quality, Demand quality!**

Quality Assurance

- Test and label the equipment
- Check the specifications
- What do you want? How can you measure it?
- What can you guarantee?
- Who is going to be blamed?

Conclusions

- You do not need to be a genius to plan and budget for a wireless implementation, just realistic and a bit “pessimistic”
- A good implementation plan from the beginning will save you lots of trouble (and money) at the end of the project
- Budget also for bringing Internet and electricity to the place, licenses, lightening protection, transport and tools
- A budget on its own is not a good plan. But a good plan has a good and detailed budget.